

PATENT COOPERATION TREATY

From the
INTERNATIONAL SEARCHING AUTHORITY

To:

see form PCT/ISA/220

PCT

WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY (PCT Rule 43bis.1)

Date of mailing
(day/month/year) see form PCT/ISA/210 (second sheet)

Applicant's or agent's file reference
see form PCT/ISA/220

FOR FURTHER ACTION
See paragraph 2 below

International application No.
PCT/JP2004/008694

International filing date (day/month/year)
15.06.2004

Priority date (day/month/year)
22.07.2003

International Patent Classification (IPC) or both national classification and IPC
B60K6/04

Applicant
TOYOTA JIDOSHA KABUSHIKI KAISHA

1. This opinion contains indications relating to the following items:

- ☒ Box No. I Basis of the opinion
- ☒ Box No. II Priority
- ☐ Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- ☐ Box No. IV Lack of unity of invention
- ☒ Box No. V Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- ☐ Box No. VI Certain documents cited
- ☐ Box No. VII Certain defects in the international application
- ☐ Box No. VIII Certain observations on the international application

2. **FURTHER ACTION**

If a demand for international preliminary examination is made, this opinion will usually be considered to be a written opinion of the International Preliminary Examining Authority ("IPEA"). However, this does not apply where the applicant chooses an Authority other than this one to be the IPEA and the chosen IPEA has notified the International Bureau under Rule 66.1bis(b) that written opinions of this International Searching Authority will not be so considered.

If this opinion is, as provided above, considered to be a written opinion of the IPEA, the applicant is invited to submit to the IPEA a written reply together, where appropriate, with amendments, before the expiration of three months from the date of mailing of Form PCT/ISA/220 or before the expiration of 22 months from the priority date, whichever expires later.

For further options, see Form PCT/ISA/220.

3. For further details, see notes to Form PCT/ISA/220.

Name and mailing address of the ISA:



European Patent Office - Gitschiner Str. 103
D-10958 Berlin
Tel. +49 30 25901 - 0
Fax: +49 30 25901 - 840

Authorized Officer

Wisnicki, M

Telephone No. +49 30 25901-538



10/563136

WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY

International application No.
PCT/JP2004/008694

IAP20 Rec'd PCT/PTO 03 JAN 2006

Box No. I Basis of the opinion

1. With regard to the **language**, this opinion has been established on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.
 - ☐ This opinion has been established on the basis of a translation from the original language into the following language , which is the language of a translation furnished for the purposes of international search (under Rules 12.3 and 23.1(b)).
2. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application and necessary to the claimed invention, this opinion has been established on the basis of:
 - a. type of material:
 - ☐ a sequence listing
 - ☐ table(s) related to the sequence listing
 - b. format of material:
 - ☐ in written format
 - ☐ in computer readable form
 - c. time of filing/furnishing:
 - ☐ contained in the international application as filed.
 - ☐ filed together with the international application in computer readable form.
 - ☐ furnished subsequently to this Authority for the purposes of search.
3. ☐ In addition, in the case that more than one version or copy of a sequence listing and/or table relating thereto has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that in the application as filed or does not go beyond the application as filed, as appropriate, were furnished.
4. Additional comments:

**WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY**

International application No.
PCT/JP2004/008694

Box No. II Priority

1. ☒ The following document has not been furnished:

☒ copy of the earlier application whose priority has been claimed (Rule 43*bis*.1 and 66.7(a)).

☐ translation of the earlier application whose priority has been claimed (Rule 43*bis*.1 and 66.7(b)).

Consequently it has not been possible to consider the validity of the priority claim. This opinion has nevertheless been established on the assumption that the relevant date is the claimed priority date.

2. ☐ This opinion has been established as if no priority had been claimed due to the fact that the priority claim has been found invalid (Rules 43*bis*.1 and 64.1). Thus for the purposes of this opinion, the international filing date indicated above is considered to be the relevant date.

3. Additional observations, if necessary:

Box No. V Reasoned statement under Rule 43*bis*.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Yes: Claims	4, 11
	No: Claims	1, 2, 5, 8, 9, 12, 15-18
Inventive step (IS)	Yes: Claims	4, 11
	No: Claims	1-3, 5-10, 12-18
Industrial applicability (IA)	Yes: Claims	1-18
	No: Claims	

2. Citations and explanations

see separate sheet

IAP20 Rec'd PCT/PTO 03 JAN 2006

Re Item V.

- 1 The following documents are referred to in this communication:

D1 : EP-A-0 903 259

D2: EP-A-1 092 581

2 INDEPENDENT CLAIMS

- 2.1 The present application does not meet the criteria of Article 33(1) PCT, because the subject-matter of claims 1, 5, 8, 12, 15 and 17 is not new in the sense of Article 33(2) PCT.

- 2.2 With regard to claim 1 document D1 discloses:

A power output apparatus that outputs power to a drive shaft, said power output apparatus comprising:

an internal combustion engine;

an electric power-mechanical power input-output module that is linked with an output shaft of said internal combustion engine and with said drive shaft and outputs at least part of power from said internal combustion engine to said drive shaft through inputs and outputs of electric power and mechanical power;

a motor that is capable of inputting and outputting power from and to said drive shaft;

an accumulator that is capable of supplying and receiving electric power to and from said electric power-mechanical power input-output module and said motor;

a power demand setting module that sets a power demand required to said drive shaft, in response to an operator's manipulation;

a target power setting module that sets a target power to be output from said internal combustion engine, based on the setting of the power demand;

a drive restriction effectuation module that, when a predetermined restricting condition is fulfilled, effects a drive restriction of said motor based on the predetermined restriction condition;

a correction module that corrects the setting of the target power based on the effected drive restriction, when the drive restriction of said motor is effected by said drive restriction effectuation module; and

a control module that executes normal control of controlling said internal combustion engine, said electric power-mechanical power input-output module, and said motor in the case of no effectuation of the drive restriction of said motor by said drive

restriction effectuation module to ensure output of the target power from said internal combustion engine and output of a power corresponding to the setting of the power demand to said drive shaft, said control module executing restriction control of controlling said internal combustion engine, said electric power-mechanical power input-output module, and said motor in the case of effectuation of the drive restriction of said motor by said drive restriction effectuation module to ensure output of the corrected target power from said internal combustion engine and output of a power in a range of the effected drive restriction from said motor.

The subject-matter of claim 1 is therefor not new (Article 33(2) PCT).

2.3 With regard to claim 5 document D1 further discloses:

A power output apparatus that outputs power to a drive shaft, said power output apparatus comprising:
an internal combustion engine;
an electric power-mechanical power input-output module that is linked with an output shaft of said internal combustion engine and with said drive shaft and outputs at least part of power from said internal combustion engine to said drive shaft through inputs and outputs of electric power and mechanical power;
a motor that is capable of inputting and outputting power from and to said drive shaft;
an accumulator that is capable of supplying and receiving electric power to and from said electric power-mechanical power input-output module and said motor; and
a control module that sets a power demand required to said drive shaft in response to an operator's manipulation and sets a target power to be output from said internal combustion engine based on the setting of the power demand, said control module controlling said internal combustion engine, said electric power-mechanical power input-output module, and said motor in the case of no fulfilment of a predetermined restricting condition to ensure output of the target power from said internal combustion engine and output of a power corresponding to the power demand to said drive shaft, in the case of fulfilment of the predetermined restricting condition, said control module effecting a drive restriction of said motor based on the predetermined restricting condition, correcting the setting of the target power based on the effected drive restriction, and controlling said internal combustion engine, said electric power-mechanical power input-output module, and said motor to ensure output of the corrected target power from said internal combustion engine and output of a power in a range of the effected drive restriction from said motor.

The subject-matter of claim 5 is therefor not new (Article 33(2) PCT).

- 2.4 The subject-matter of independent claims 8 and 15 is, respectively an automobile and a control method for a power output apparatus. Since these claims comprise the same features as claim 1, they are also not new (see paragraph 2.2 above).
- 2.5 The subject-matter of independent claims 12 and 17 is, respectively, an automobile and a control method for a power output apparatus. Since these claims comprise the same features as claim 5, they are also not new (see paragraph 2.3 above).

3 DEPENDENT CLAIMS

- 3.1 The present application does not meet the criteria of Article 33(1) PCT, because the subject-matter of claims 2, 9, 16 and 18 is not new in the sense of Article 33(2) PCT.
- 3.2 The features of dependent claims 2, 9, 16 and 18 (a charge-discharge electric power measurement module that measures a charge-discharge electric power used to charge said accumulator or obtained by discharging said accumulator; and an electric power demand setting module that sets an electric power demand for charging or discharging said accumulator, based on a predetermined charge-discharge condition, wherein said correction module corrects the setting of the target power to cancel a difference between the charge-discharge electric power measured by said charge-discharge electric power measurement module and the electric power demand set by said electric power demand setting module) are also known from D1 (see paragraphs 56 and 64). The subject-matter of claims 2, 9, 16 and 18 is therefor not new (Article 33(2) PCT).
- 3.3 The present application does not meet the criteria of Article 33(1) PCT, because the subject-matter of claims 3, 6, 7, 10, 13 and 14 does not involve an inventive step in the sense of Article 33(3) PCT.
- 3.4 The features of claims 3 and 10 are that the target power setting module specifies a target torque and a target revolution speed to set the target power, and the correction module varies the specified target revolution speed to correct the target power. However, it is a basic knowledge of the skilled person that mechanical power is a result of multiplication of torque and revolution speed. Therefor, a variation of one of

the torque and the revolution speed would be merely one of two straightforward possibilities from which the skilled person would select, in accordance with circumstances, without the exercise of inventive skill, in order to achieve a variation of power. Hence, no inventive step is present in the subject-matter of claims 3 and 10 (Article 33(3) PCT).

- 3.5 The features of claims 6 and 13 are that the electric power-mechanical power input-output module comprises:

a three-shaft power input-output assembly that is connected with three shafts, that is, said output shaft of said internal combustion engine, said drive shaft, and a third shaft, and specifies input and output of power from and to one residual shaft among said three shafts, based on powers input and output from and to two shafts among said three shafts; and

a generator that inputs and outputs power from and to said third shaft.

The three shaft power input-output assemblies are generally known in the art (see e.g. D2, figure 1). The use of such assembly is a straightforward option in order to provide a single output by two different power sources. Hence, no inventive step is present in the subject-matter of claims 6 and 13 (Article 33(3) PCT).

- 3.6 The features of claims 7 and 14 are that the electric power-mechanical power input-output module comprises a pair-rotor generator having a first rotor, which is linked with the output shaft of said internal combustion engine, and a second rotor, which is linked with said drive shaft and rotates relative to the first rotor, said pair-rotor generator outputting at least part of the power from said internal combustion engine to said drive shaft through input and output of electric power by electromagnetic interaction between the first rotor and the second rotor.

The pair-rotor generators are generally known in the art (see e.g. D2, figure 1). Their use in a power output apparatus comes within the scope of the customary practice followed by persons skilled in the art, especially as the advantages thus achieved can readily be foreseen. Consequently, the subject-matter of claims 7 and 14 also lacks an inventive step.

- 4 The combination of the features of dependent claim 4 is neither known from, nor rendered obvious by, the available prior art. If the applicant is of the opinion that these features are inventive, a new single independent claim pro category should be drafted to include these features, bearing in mind that any independent claim should be drafted in the two-part form with the features known in combination in D1 placed

**WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING
AUTHORITY (SEPARATE SHEET)**

International application No.

PCT/JP2004/008694

in the preamble of such a claim in accordance with Rule 6.3(b)(I). The applicant should indicate in his letter of reply which problem is solved by the new independent claim(s).